

# NOTES 07: LINEAR REGRESSION

Stat 120 | Fall 2025

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$$\text{flipper\_length\_mm}^{\wedge} = 136.73 + 0.02(\text{body\_mass\_g}) \quad (1)$$

Observation

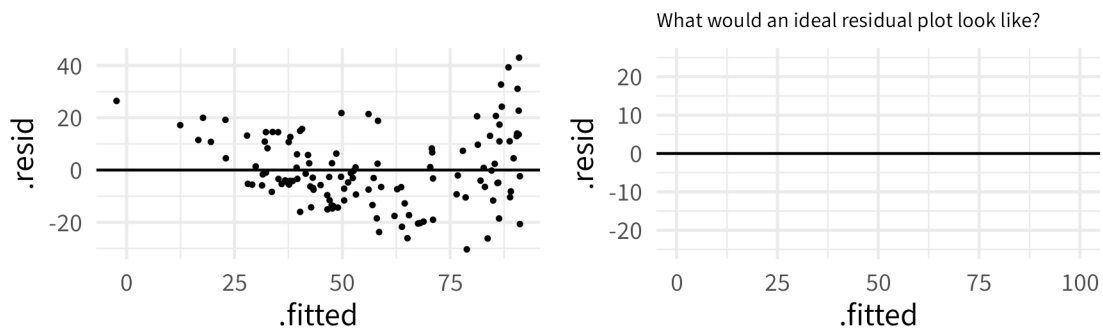
Prediction

Residual

Example: I grab a penguin with a flipper length of 193mm and a body mass of 3475g. What is the observation, prediction, and residual in this case?

It can be helpful to look at a residual scatterplot when checking for linearity and outliers.

```
dives_lm = lm(DiveHeartRate ~ Duration, data = penguin_dives)
dives_aug = augment(dives_lm)
p1 = ggplot(dives_aug, aes(x = .fitted, y = .resid)) +
  geom_point(size = .5) +
  geom_hline(yintercept = 0)
```



Below is the slope and intercept for the transformed model. Write out the linear regression equation and provide an in-context interpretation of the intercept and slope.

(Intercept)	Duration
-0.007926	-0.001817

When do we do transformations?

Why is it important that we have a linear relationship?

What is the point of fitting a linear regression?